PATENT SPECIFICATION 1,076,117

DRAWINGS ATTACHED.

1,076,117

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Index at Acceptance:—B5 A(1G7B, 1G10, 1R6C, 2B2, 2H4).

Int. Cl. :—B 29 d.

COMPLETE SPECIFICATION.

Confectionary Product and Apparatus.

We, UNILEVER LIMITED, a Company registered under the laws of Great Britain, of Port Sunlight, in the County of Chester, England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to confectionary products and apparatus and, more particularly, to improvements in frozen confections and apparatus for making such confections.

Variegated or multi-flavoured ice cream confections, i.e. ice creams, water ices, sherberts, sorbets etc, have been produced heretofore by simultaneously extruding ice cream confections having different flavours or other properties through one or more nozzles into a mold or container. The different flavours may be deposited in separate layers or intermixed by suitable operation of the depositing apparatus. In the "ice cream on a stick" type of confection, the strips or cores of ice cream generally extend lengthwise of the confection and thus provide a sameness of appearance, except for colour, to the multi-flavour product confection.

The present invention provides apparatus for extruding the plastic material with spiral stripes of different materials, preferably of different colours.

By extruding such spirally striped material into a mould an ice lolly or the like can be produced of a novel and attractive form.

One form of the invention provides a nozzle for extruding plastic material comprising a nozzle member having a generally longitudinal passage through which the material can be extruded, the nozzle comprising a twisted partition disposed in said passageway so as to divide said passageway into discrete channels, means for feeding different plastic materials, preferably of different colours, separately to the different channels and means for rotating the nozzle member and twisted partition while the materials are being extruded to produce a spirally striped extruded product.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a plan view of an array of nozzles embodying the invention with parts broken away;

Figure 2 is a view in section taken along the line 2—2 of Figure 1 and looking in the direction of the arrows;

Figure 3 is a view in vertical section on an enlarged scale and with parts broken away of a nozzle extruding a frozen confectionary product into a conventional freezing mold;

Figure 4 is a view in section taken along the line 4—4 of Figure 3 and looking in the direction of the arrows;

Figure 5 is a view in section taken along the line 5—5 of Figure 3; and

Figure 6 is a perspective view of a frozen confectionary product according to the invention.

A nozzle 10, according to the present invention, can be part of an array 11 of similar nozzles 12 and 13, (Figure 2) to satisfy mass production needs. Each nozzle 10 (Figure 3) includes a nozzle member 14, which may be of tubular shape, having a longitudinal passageway 15. A twisted partition 16, having, for example, a two and one-half full turn helical twist, is fixed, by welding or the like, to the interior tubular surface of the nozzle member 14, dividing the longitudinal passageway 15 into two discrete longitudinal channels 17 and 18.

A vertical conduit 19, and an associated reservoir 20, both disposed above the nozzle

member 14 are in vertical communication with the channel 17. A thin semicircular plug 21 (Figure 4), interposed between the interior nozzle member wall forming the longitudinal passageway 15 and the twisted partition 16 defining the upper end of the channel 18, provides a barrier isolating the channel 18 from the reservoir 20 and conduit 19.

A vertical conduit 22, and an associated annular reservoir 23 (Figure 5) transversely circumscribing the nozzle member 14 near the upper end of the longitudinal passageway 15, are in free transverse communications with the channel 18 through a slot 24 formed in the nozzle member 14.

Means such as a gear 25 (Figure 2), fixed to the outer surface of the nozzle member 14, at the transverse midplane of the nozzle member 14 is provided to turn the nozzle member 14 during frozen confection extrusion to produce, by operating in combination with the twisted partition 16, a column 26 of spirally striped, extruded frozen confectionary product, as shown in Figure 3. Similarly arranged gears 27 and 28 (Figure 2) drive the nozzles 12 and 13, respectively. Idler gears 29 and 30 mesh with the gears 27 and 28 to drive the gears 27 and 28 at the same speed and in the same direction of rotation as the gear 25.

Driving power to turn the array of nozzles 11 can be provided by any suitable conventional means such as a pneumatic cylinder with a rack and pinion gear, or, as shown for example in Figures 1 and 2, a gear head motor 32 with a driven gear 32*a*. The driven gear 32*a* meshes with gear means 31 composed of a driven gear 33 that transfers the power input from the motor 32 to a conventional train of gears 34, 35, 36 and 37. The nozzles 10, 12 and 13 are thus driven at the same speed and in the same direction by the motor 32, the driven gear 32*a*, the gear means 31 and the gears 25, 27, 28, 29 and 30 in the manner hereinbefore described.

The conduits 19 and 22, reservoir 20 and the annular reservoir 23 are all formed in a set of vertically aligned stacked plates 38 held in alignment by press fitted dowels, or the like (Figures 2 and 3). The stacked plates 38 permit the nozzles to be taken apart completely for thorough cleansing with minimum difficulty. The gear means 31, gear head motor 32, the nozzle members 10, 12 and 13 and the idler gears 29 and 30 are also mounted in and rotatably supported within the vertically aligned stacked plates 38. Thus a distributing plate 39 (Figure 1), uppermost in the vertical stack of plates 38, is provided with sets of holes 40 and 41, which form, in part, the conduits 19 and 22, respectively. Immediately below the distributing plate 39 is an upper flow plate 42 (Figures 2 and 3) provided with pairs of recesses 43 and holes 44, which, in alignment with the holes 40 and 41 in the distributing plate 39, also form, in part, the conduits 19 and 22, while the recesses 43 also form the reservoirs 20 for vertical communication between the channels 17 and the conduits 19.

A lower flow plate 45, immediately below and aligned with the upper flow plate 42, has a recess 46 which forms the annular reservoir 23, and a portion of the associated conduit 22 for transverse communication with the channel 18 through the slot 24 formed in the nozzle member 14 just below the semicircular plug 21 that seals the channel 18 from the reservoir 20.

A gear plate 47 (Figure 2) is disposed directly below the lower flow plate 45 and in general alignment therewith. The pinion gear means 31, the idler gears 29 and 30 and the gears 25, 27 and 28 associated with the nozzles 10, 12 and 13 are all supported by the gear plate 47 for rotation thereon in the manner described.

A striped frozen confection 48 (Figures 3 and 6) is produced by extruding two different frozen confections in the plastic state through the nozzle 10, while the nozzle member 14 is being rotated about the longitudinal axis. The two confections form a spiral when emerging from the nozzle owing to the action of the twisted partition on the exuding material.

During frozen confection extrusion, the nozzle 10 can be plunged into the mold with the open end of the nozzle adjacent to the bottom of the mold and then withdrawn by any convenient means as the ice cream is extruded through the nozzle or, as shown in Figure 3, the two streams of ice cream issuing from the nozzle 10 can be deposited directly in the mold 49 in generally helical layers. The layers of ice cream thus deposited in the mold 49 extend across the bar in generally alternating bands 51 and 52 imparting a striped appearance to the confection.

As shown in Figure 6, a typical frozen confection 48 includes a stick 50 inserted in the confection 48 after the mold is filled, but before the ice cream has been hardened fully. The stripes 51 and 52 of different ice creams, ices and the like produce an unusual appearance not heretofore found in other known frozen confectionary products. It should be appreciated however that the stripes 51 and 52 shown in Figure 6 are to a certain extent idealised and may not in practice be as regular as that shown, however this is generally considered not to detract from the attractiveness in appearance of the product.

In operation (Figure 3) a frozen confectionary product 52, such as a conventional ice cream or sherbert, or a semi-frozen water ice, is extruded through conduit 19 and reservoir 20, into the channel 17 formed by the twisted partition 16 and the longitudinal

passageway 15 in the nozzle member 14. A different frozen confection 51, which may be an ordinary ice cream or sherbert differing from the frozen confection 52 in flavour, type, texture, and/or colour, is extruded through the conduit 22 and annular reservoir 23, into the slot 24 communicating with channel 18 in the nozzle member 14.

The gear means 31 and the gear head motor 32 driving the gear 25 in the manner hereinbefore described, rotates the nozzle member 14 and the twisted partition 16 therein while the frozen confections 51 and 52 are being extruded along the inclined sides of the partition 16 in the nozzle 10 and into the mold 49. The direction of rotation of the nozzle is in the opposite direction to the rotational direction in which the product emerges from the nozzle. This minimizes any tendency of the exuding product to rotate during extrusion and assists in production of a stable striped product.

The frozen confections 51 and 52 deposited in the mold 49 are cooled from a plastic to a frozen state by any suitable method, such as immersing the mold 49 in a freezing brine solution. The stick 50, or means for manipulating the frozen confection 48 is inserted into the base of the striped frozen confection 48 before the confection 48 solidifies, and is frozen in the partially exposed position perpendicular to the base of the confection 48 as shown in Figure 6. The mold 49 and confection frozen therein are removed, after solidification, from the freezing brine solution and warmed, for example, by contacting the external shell of the mold 49 with a warm water bath to melt slightly the frozen confection 48 surfaces and thereby permit the frozen confection 48 to be withdrawn from the mold 49 for packaging, shipping, sale and consumption.

WHAT WE CLAIM IS:—

1. A nozzle for extruding plastic material comprising a nozzle member having a generally longitudinal passage through which the material can be extruded, the nozzle comprising a twisted partition disposed in said passageway so as to divide said passageway into discrete channels, means for feeding different plastic materials, preferably of different colours, separately to the different channels and means for rotating the nozzle member and twisted partition while the materials are being extruded to produce a spirally striped extruded product.

2. A nozzle according to claim 1 in which a spirally twisted plate constitutes said twisted partition.

3. Apparatus for producing a frozen confectionary product having distinct stripes of different materials comprising a nozzle according to claim 1 or claim 2, a mould arranged to receive the spirally striped extruded product and means for freezing the product in the mould.

4. Apparatus for producing a frozen confectionary product substantially as herein described with reference to the accompanying drawings.

5. A confectionary product produced by apparatus according to any one of the preceding claims.

6. A method of producing a frozen confectionary product comprising extruding the confectionary product in plastic form through the nozzle according to claim 1 while rotating said nozzle and allowing the spirally striped extruded product to become frozen.

7. A method according to claim 6 in which the direction of rotation of the nozzle opposes the direction of rotation produced by the twisted partition so that the spirally striped product is extruded with substantially no rotational movement.

8. A frozen confectionary product produced by a method according to claim 6 or claim 7.

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Agent for the Applicants.

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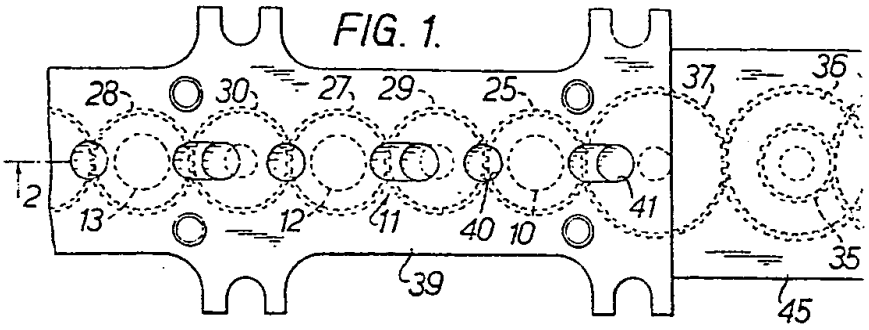
from which copies may be obtained.

FIG. 1.



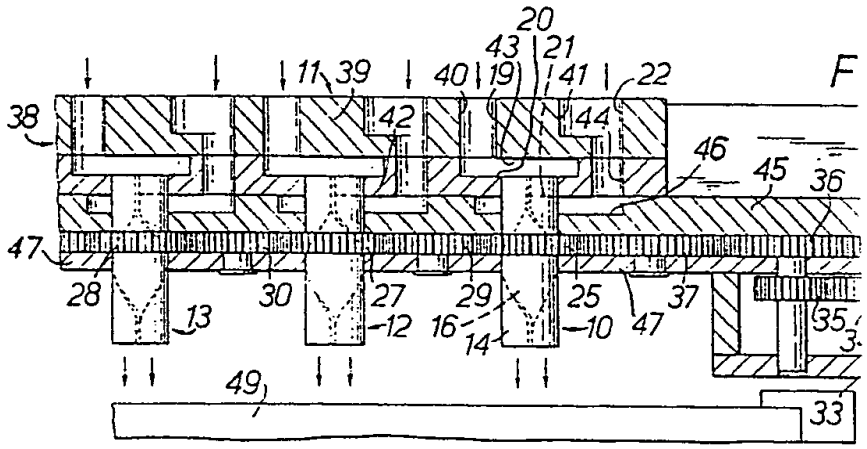


FIG. 4.

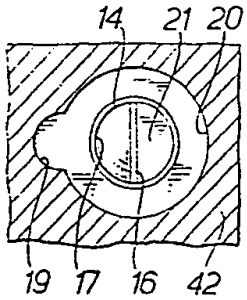
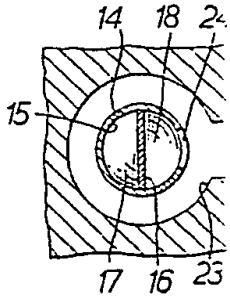


FIG.



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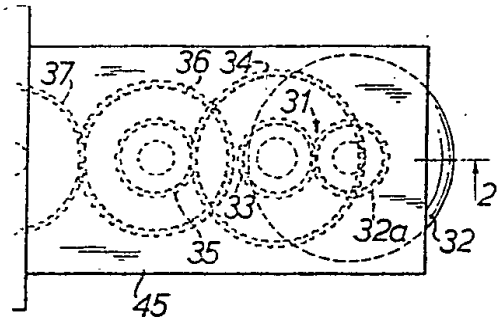


FIG. 3.

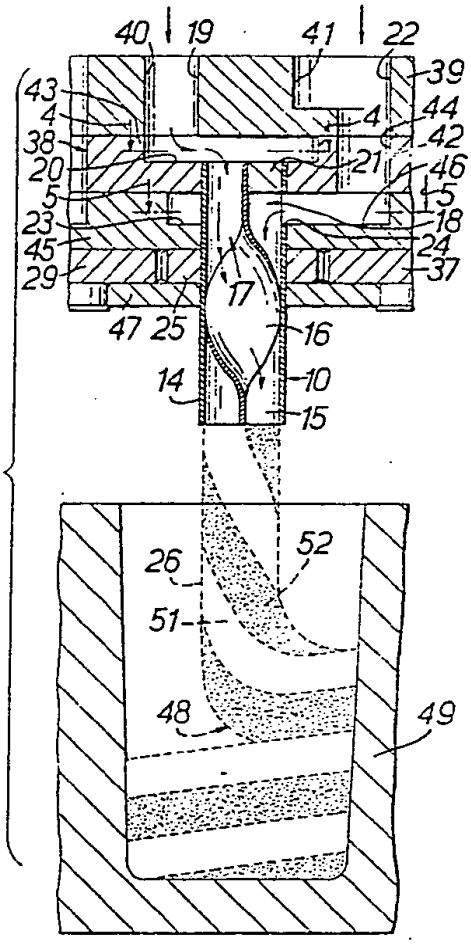


FIG. 2.

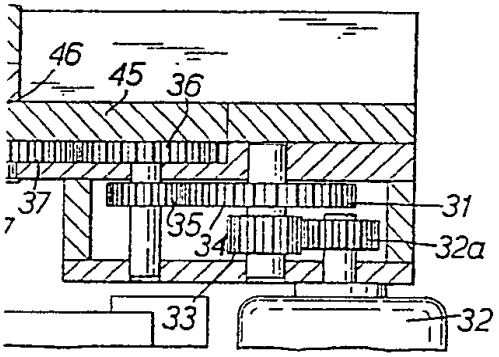
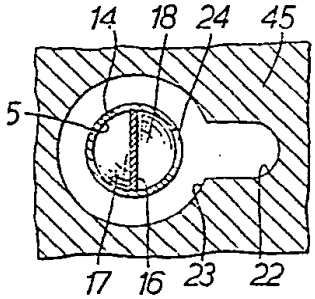


FIG. 5.



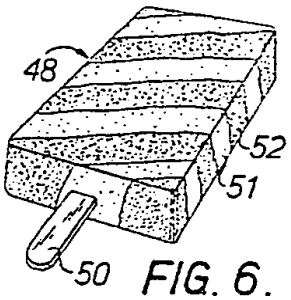


FIG. 6.

FIG. 1.

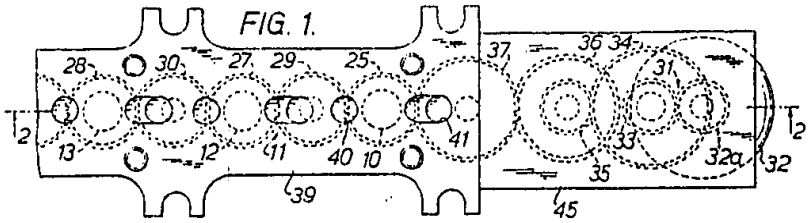


FIG. 2.

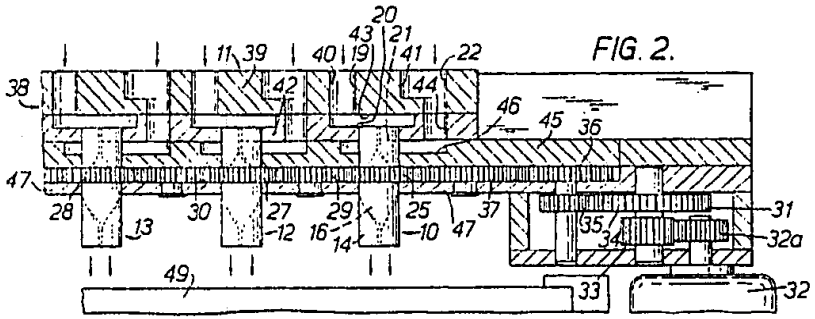
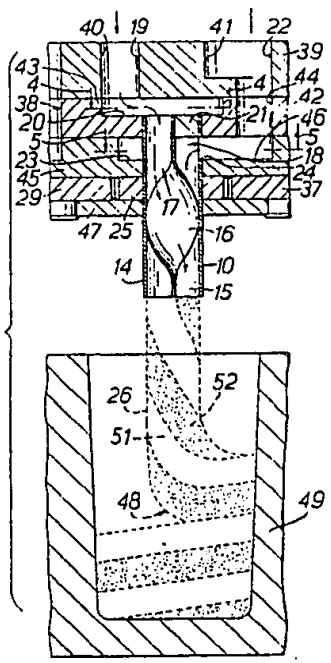


FIG. 3.



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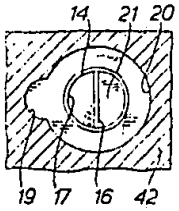
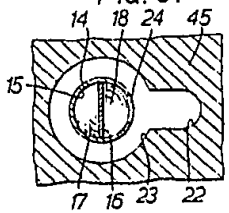


FIG. 5.



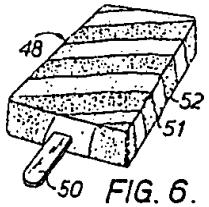
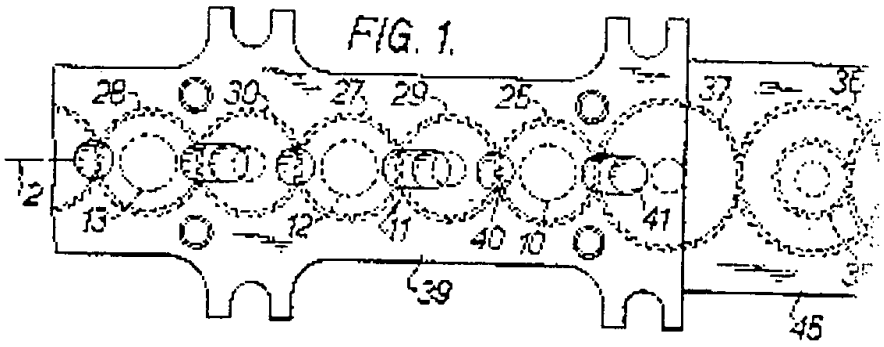
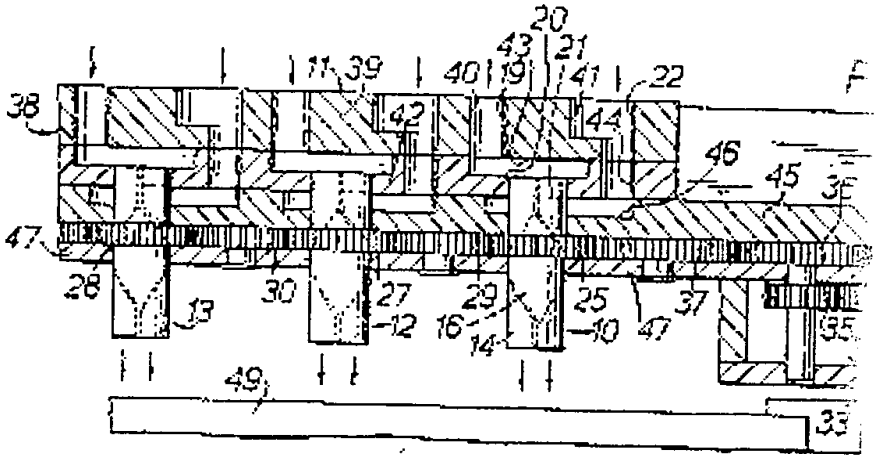


FIG. 6.

FIG. 1.





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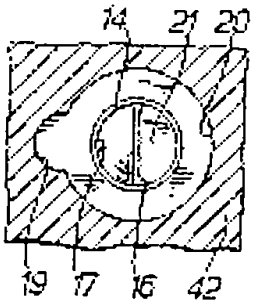

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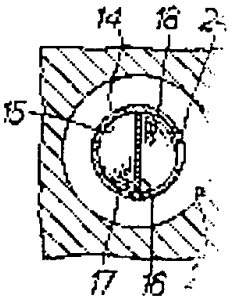

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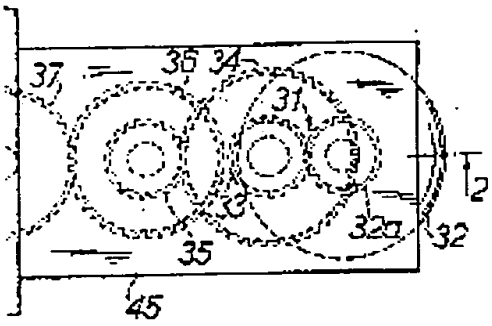


FIG. 2.

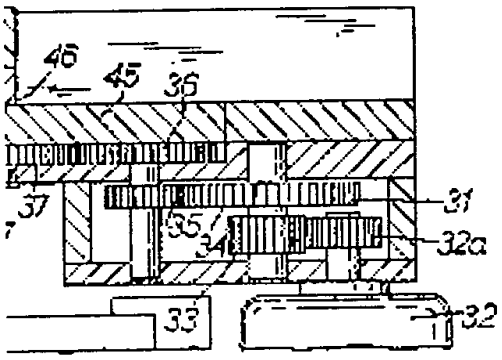
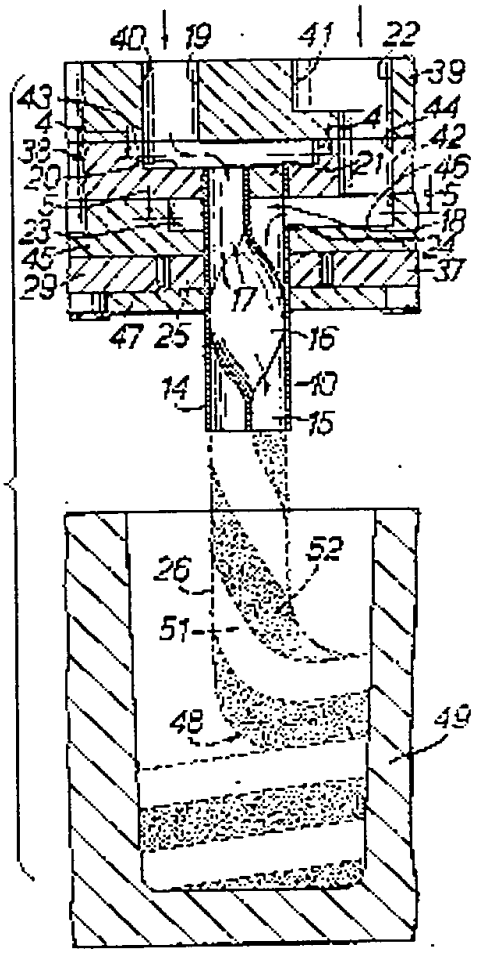


FIG. 3.



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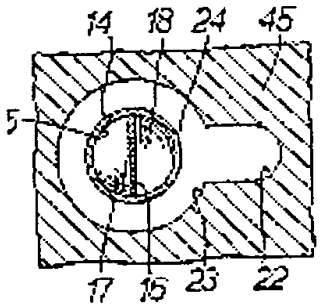


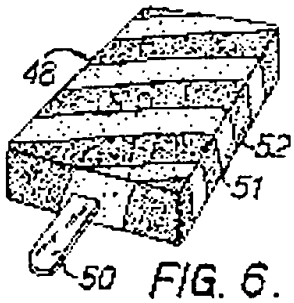


FIG. 6.

FIG. 1.

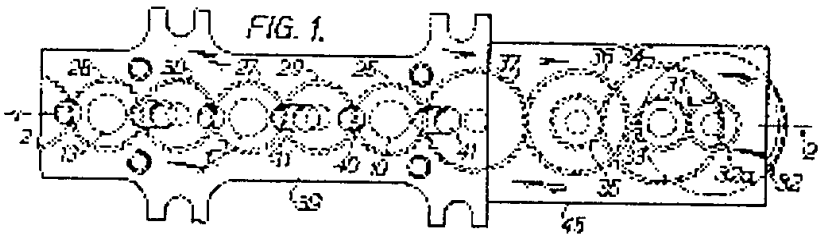
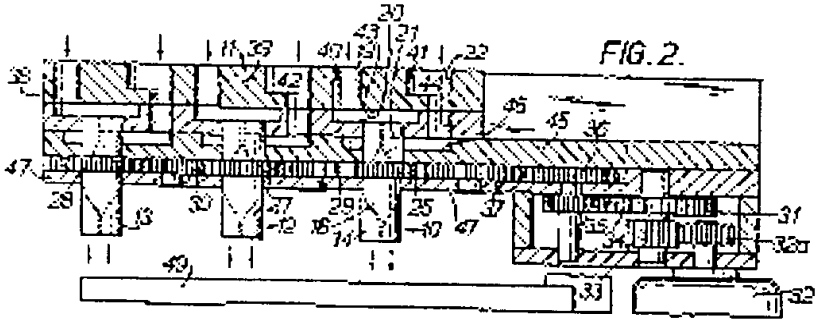


FIG. 2.



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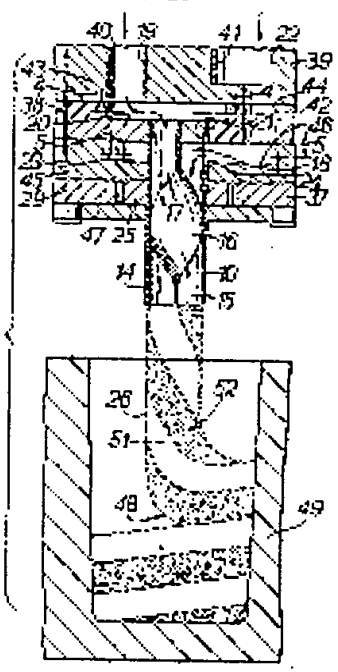

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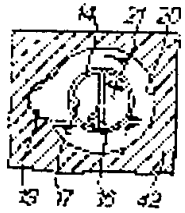

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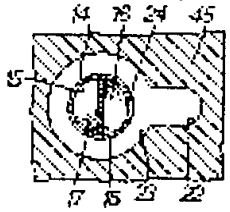

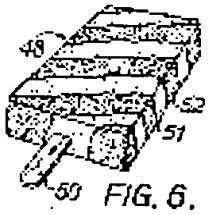

FIG. 6.